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September 29, 1970

Attention: John C.

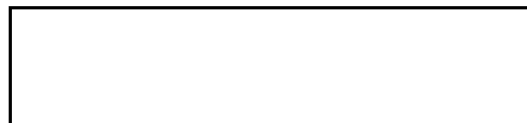
Dear John:

Enclosed for your files are three (3) copies of  
Activity Summary, /2201201-AS-15.

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Sincerely,



Senior Staff Scientist

PSC/c  
Enclosures

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SEPARATED FROM CLASSIFIED  
ATTACHMENTS

Declassification Review by NGA/DoD

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25X1

September 29, 1970

## ACTIVITY SUMMARY

To: John C.  
 From: [REDACTED] 25X1  
 Subject: Contract Visit to Customer Facility  
 [REDACTED] 25X1  
 Date(s): September 23, 24, 1970  
 Reference: [REDACTED]/2201201-AS-15 25X1

The objective of this trip was to continue implementation of low contrast image manipulation, and to lay-out detailed objectives for the next two weeks of the laboratory program. The primary accomplishments of this visit are summarized in this Activity Summary, and the Program Plan for the weeks of 28 September and 4 October is attached.

A series of filters and targets had been fabricated since the previous visit as per objectives delineated at that time. The filters were low frequency attenuation filters varying in diameter from 1.6mm to 9.6mm. The density range varied from 0.3 to 0.85D in a primary group and up to 1.7D in a secondary group. The primary group are those filters selected as most likely candidates although both groups are for test purposes. The targets prepared for the lab tests include an Air Force tri-bar target, a Diffraction Limited square wave target, and CORN target imagery.

During these two days we used the Air Force tri-bar target for test purposes. The resolution of this target was at Group 4#5, based on analysis with a microscope. The target was viewed through

GROUP 1

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the optical processing system under different conditions, as noted in the lab notebook. Resolution up to Group 5#1 was recorded with the image manipulation system. Photographs of the pertinent results were recorded. The above target is for test purposes and is being used to provide an input as to the manipulative significance of particular system configurations. The system is altered with the transmission filters and with source diameter controls.

During this visit a group discussion was held with Maj. Hayden P. Hank C., John C., and [ ] concerning the program objectives, both immediate and long term. The technology being applied to the low contrast imagery was also discussed. The term "low contrast" is used here in a general sense. Specifically we refer to two separate phenomena that occur, one being a drop-off of the frequency response with increasing object spatial frequency, the second being the addition of a constant dc term in the spectrum because of atmospheric scatter, lens flare etc:.. 25X1

The next program visit is scheduled for the week of October 4. The specific days will be scheduled at the customers convenience. During the past several weeks, two texts were delivered. They are Diffraction Coherence in Optics, M. Francon, Pergamon Press, delivered on 24 August, and Optical Data Processing, A.R. Shulman, John Wiley & Sons, delivered on 2 September.

The Program Plan attached to this Activity Summary is directed to the evaluation of the filters and measurement of system parameters.

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## Program Plan

To John C.

25X1

From

Date 24 Sept., 1970

Subject Planned program for two week period beginning 25 Sept. 1970.

The details of the present status of this program are available in the laboratory notebooks. The tasks to be performed during the coming two weeks are a continuation of the present effort, to quantify the best operations that have been performed and to record the output data for demonstration. The tasks to be performed are as follows.

- (1) With the present set of filters determine significant increments

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between filters in density and in source diameter relative to filter diameters. By significant increments is meant those that have a manipulative impact on the target response. The Air Force tri-bar target can be used through this series. By performing this we can reduce the number of filters to be considered and the possible positions of the ground glass.

- (2) Determine density of filters that provide best response. We have narrowed the range during the effort on 23, 24 Sept.. Trace the filters to determine their density distribution.. This data will be used to plot system response curves.

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- (3) Determine the effective source diameter as the diffuser is moved to predetermined incremental positions. This can be determined by placing camera back into filter plane, recording the distribution, and tracing it. This data will be used to plot system response.
- (4) Trace processed imagery and input imagery to determine response. This will be used to quantify manipulative gain.

These goals can be concluded in about a two week period. At that time we will use the data to plot response curves to describe processing system as a function of output performance.

Photographs of processed data will be generated for comparison and substantiation.

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of image improvement: